

collection, Peabody Museum, by J. L. Wortman. The present instalment contains details of *Sinopa minor*, *Sinopa major*, together with observations upon the marsupial or metatherian relationships of the Creodonts. A summary of the results obtained for the whole series of Eocene Carnivora in the Marsh collection is appended.—New exposures of eruptive dikes in Syracuse, by P. L. Schneider.—Petrography of recently discovered dikes in Syracuse, N.Y., with note on the presence of melilite in the Green Street dike, by C. H. Smyth, jun.—The significance of certain Cretaceous outliers in the Klamath region, California, by O. H. Hershey.—The action of copper sulphate upon iron meteorites, by O. C. Farrington.—The classification of meteorites as active and passive towards solutions of copper sulphate, as given by Wöhler, is shown to be untenable. The rapidity with which the copper is deposited upon a thoroughly cleaned surface appears to decrease with the increase of the percentage of nickel, the temperature remaining constant, and hence meteoric iron, which always contains nickel, may be readily distinguished from terrestrial iron by this reagent.—A petrographical contribution to the geology of the eastern townships of the province of Quebec, by J. A. Dresser.—The action of carbon dioxide upon the borates of barium, by L. C. Jones. A criticism of the method for estimating boric acid of Morse and Burton.—Studies in the Cyperaceæ, by T. Holm.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 19.—"On the Correlation between the Barometric Height at Stations on the Eastern Side of the Atlantic." By Miss F. E. Cave-Brown-Cave, Research Student of Girton College, Cambridge, with some assistance from Karl Pearson, F.R.S., University College, London.

In a memoir on the correlation and variation of the barometric height at divers stations in the British Isles by Prof. Karl Pearson and Dr. Alice Lee, it is suggested (i.) that interesting results might be obtained by correlating the barometer at stations on the east and west sides of the Atlantic, allowing an interval of time between the observations (see *Phil. Trans.* vol. cxc. A. p. 459); and (ii.) that with a certain distance between stations, the correlation would be found to be negative, i.e. a high barometer at the one station corresponding to a low barometer at the second (see p. 467).

In order to deal with these points, steps were taken in 1897 to collect the necessary material. Twenty years, 1879-1898 inclusive, were selected for consideration, and the early morning barometric observations for these years, copied from material provided by the kindness of the British and other Meteorological Offices.

A preliminary study has been made of the East Atlantic stations, and this has impressed us with the desirability of continuing, if possible, our chain of stations right down the west coast of Africa, even to the Cape. The great mass of material to be dealt with, and the many new problems which arise in an almost entirely novel investigation of this kind, have meant, of course, very slow progress, and while publication of the final conclusions must be delayed for some time yet, it seems desirable to draw attention to a few of the results already reached for the East Atlantic stations.

In the first place it was soon discovered that the winter and summer months (equinox to equinox) must be treated separately. It was already known that the average height varied considerably in the summer and winter months, but there are also very significant differences in the variability, and, in what we are most concerned with, the correlation. For example, there is hardly any correlation (0.04) between Lisbon and Valencia in the summer, but in the winter it is quite considerable (0.22). Further, the results worked out in two groups of ten years each, show that very sensible differences in mean, variation, and correlation can exist between one decade and the next, so that at least twenty and probably more years are desirable if we are to obtain steady values for the barometric constants. In the next place, while we have found a small but sensible cross Atlantic barometric correlation after a definite interval of time, we must wait for more complete American data, and for still closer investigation of the best interval for different stations

before results on this point are published. The second suggestion, however, has been amply verified, and to draw attention to this is the principal object of the present preliminary notice.

As we go generally south from any station, we reach a point at which for readings on the same day there is no correlation at all. *For stations beyond this point the correlation becomes negative, reaches a negative maximum, and then begins to decrease.* Clearly it must reach a second zero. What happens after this? Does the correlation remain zero for all greater distances? To fully answer this problem we must obtain data south of Sierra Leone—in fact, we want data for St. Helena, Ascension, and the Cape, and have taken steps to obtain them.

Thus Valencia is positively correlated with Bôdô. Lisbon, however, is negatively correlated with Bôdô, but positively with Valencia. We require to go as far south as Funchal to find a negative correlation with Valencia. To get a negative correlation with Lisbon we must go as far as Sierra Leone, which has become positive again for both Bôdô and Valencia. At St. Helena we have our second negative correlation zone for both Bôdô and Valencia, while we are only in the second positive zone for Lisbon. In other words, the curve of barometric correlation with distance from a station appears to give roughly the form:—



We do not find with increasing distance a diminishing correlation, as of a curve rapidly asymptoting to $0 \cdot x$, but as it were a wave-curve of diminishing amplitude. There is not apparently an area of positive correlation surrounded by a field of zero correlation, but going south there are only *points* of zero correlation, not *regions* of zero correlation. Probably if the area of investigation can be extended we shall find *lines* not zones of zero correlation round each station, separating districts of positive and negative correlation. What we are certain about is, that a zone of positive correlation is followed by a zone of negative correlation. What we are less sure about is, that this negative zone is again followed by a positive zone of much less intensity, but our rather meagre results certainly suggest it.

Full numerical data are given in the paper for Bôdô, Skudenes, Valencia, Lisbon and Funchal, and less complete data for Sierra Leone and St. Helena.

We hope shortly to complete our calculations to the Cape, and then to finish the work already begun on the American stations. Meanwhile, we think that the correlation of a series of stations following roughly a parallel of latitude across Europe and Russian Asia would throw a flood of light on whether a chain of roughly north and south stations differs wholly in character from a chain of east and west stations. The magnitude of the computations, however, almost precludes the idea that any individual worker or workers can hope to complete such a task within a reasonable period.

DUBLIN.

Royal Dublin Society, June 18.—The Right Rev. Monsignor Molloy in the chair.—Prof. J. Joly, F.R.S., communicated a paper by Mr. W. B. Wright, of the Geological Survey, on some results of glacial drainage round Montpelier Hill, co. Dublin. At the lowest point of the ridge which connects the outstanding hill of Montpelier with the main mass of the Dublin Mountains to the south is a dry, transverse gap, connecting the valleys on either side; this gap cuts directly across the junction of the granite and slate, and has apparently no reference to the structure of the rock in which it is excavated. The occurrence in one of the side valleys of a thick deposit of gravels, ending in a fairly straight line on the Boulder Clay plain, which stretches up to its mouth, is suggestive of the occurrence in this valley, during the later stages of the decay of the ice sheet, of an ice-dammed lake which had its overflow channel through the gap. The gravel is composed for the most part of limestone and other material foreign to the ice sheet, indicating that the depositing waters flowed mainly from the ice sheet. At the other end of the gap are some mounds of granite and slaty material, probably the debris from it. At a subsequent period the drainage appears

to have been directed round the north side of Montpellier Hill, and has left its traces here in a series of terraces and incipient channels.—Dr. E. J. McWeeney made some remarks on a bacteriological method of air examination.—Mr. H. J. Seymour, of the Geological Survey, gave a short note on the occurrence of cassiterite in the Tertiary granite of the Mourne Mountains, co. Down.—Monsignor Molloy described and demonstrated working models of a three-phase generator and a three-phase motor, suitable for lecture purposes.

PARIS.

Academy of Sciences, July 15.—M. Bouquet de la Grye in the chair.—On the structure and history of the lunar crust: observations suggested by the fifth and sixth numbers of the "Photographic Atlas of the Moon," published by the University of Paris, by MM. Leewy and P. Puiseux.—Preparation and properties of a silicide of vanadium, by MM. H. Moissan and Holt. A mixture of vanadium oxide, V_2O_5 , with about five times its weight of pure silicon is heated in the electric furnace for four or five minutes. The compound VSi_2 is formed; it can also be prepared by the action of magnesium powder upon a mixture of silicon and vanadic acid. Heated in a current of hydrochloric acid gives silicochloroform and a mixture of chlorides of vanadium.—On the coccidia found in the kidney of *Rana esculenta* and on the general infection which it produces, by MM. A. Laveran and F. Mesnil. It is shown that this organism, *Hyaloklossia Lieberkühni* of Labbé, is really an Isospora, and is renamed by the author *Isospora Lieberkühni*. Diagrams are given showing its different stages of growth; it causes an acute mixed nephritis in the frog.—The direct hydrogenation of acetylenic hydrocarbons by the method of contact, by MM. Paul Sabatier and J. B. Senderens. The method of direct hydrogenation by contact with nickel or copper has been applied to acenanthylidene and phenyl-acetylene. With nickel the chief product in the first case is normal heptane; with copper a heptene together with a small amount of heptane. With phenyl-acetylene nickel gives chiefly ethylcyclohexane; with copper ethylbenzene, with small quantities of diphenyl-butane and metastyrolene.—Report on the experiments made at the Observatory of Montsouris relating to the composition of atmospheric air, by MM. Armand Gautier, Haller and Ad. Carnot. The experiments of MM. Lévy, Henriet and Pécol on the existence of an easily oxidisable gaseous compound in the air of Paris have been repeated and confirmed (see p. 308).—The use of hail rockets, by M. E. Vidal. Evidences are given of the power possessed by the rockets of breaking up storm clouds, and especially of preventing damage to vines by hail.—Application of the method of the arithmetical mean to the surfaces of Riemann, by M. A. Korn.—On the formation of liquid drops and the law of Tate, by MM. Leduc and Sacerdote. The law of Tate states that the weight of the drops of a given liquid falling from the extremity of a tube is proportional to the radius of the end of this tube. It is shown that this is only approximately true and that the usual reasoning establishing this law is inexact. A new expression is deduced which is submitted to an experimental study.—On binary accords, by M. A. Guillemin.—On a new organic vapour in atmospheric air, by M. H. Henriet. Filtered air is mixed with steam and this is then condensed. The condensed water was then examined and found to contain a minute amount of what would appear to be a substituted formamide.—On the properties and constitution of the peroxides of zinc, by M. de Forcrand.—On oxyisopropylphosphinic acid, by M. C. Marie.—On a new method of preparation of α -substituted β -ketonic esters, by M. René Locquin.—The electric resistivities of pathological blood serums and serous effusions in man, by MM. Lesage and Dongier.—The zymase from *Eurotiosis Gayoni*, by M. Mazé. It has been found that the zymase is present in considerable quantity in the developing mycelium, but that with aerobic cultures the quantity of the zymase present in unit weight of mycelium diminishes rapidly with the age of the cultures.—On the cure of "la casse" in wines by the addition of sulphurous acid, by M. J. Laborde. The author criticises the views of MM. Bouffard and Dienert, and gives fresh experimental evidence in favour of the hypothesis originally advanced by him.—Researches on the Culicids of Algeria, by M. H. Soulié.—On the treatment of black rot, by M. A. Prunet. Mildew and black rot being different diseases the same remedies should not be applied to both. The

maximum interval which should be allowed to elapse between two successive treatments with the copper sulphate solution has been determined experimentally.—On the lower Gothlandian of the Armorican massif, by M. F. Kerforn.—Some facts, new or little known, concerning the Glacial period, by M. David Martin.

NEW SOUTH WALES.

Linnean Society, May 28.—Mr. J. H. Maiden, president, in the chair.—Descriptions of new genera and species of Lepidoptera (Fam. Noctuidæ), by Dr. A. Jefferis Turner.—An ascobacterium from the sugar cane, by Mr. R. Greig Smith.—Preliminary note on the geology of the Queensland coast, with references to the geography of the Queensland and New South Wales plateau, by Mr. E. C. Andrews. An attempt is here made to refer the origin of the present coastal configuration of Queensland and Northern New South Wales primarily to a recent variable crustal movement. The topography of the Cordillera and the continental shelf is found to throw light on Barrier Reef problems.—Notes on the botany of the interior of New South Wales (part vi.), by Mr. R. H. Cambage. The conspicuous botany of the country between Marsden, near Lake Cowal, and Narrandera is described. Mention is made of the damage done to certain trees, notably dogwood (*Myoporum deserti*), by the rabbits.

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